

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

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| Applicant's or agent's file reference PHNL030776WO | FOR FURTHER ACTION | See item 4 below |
| International application No. PCT/IB2004/051102 | International filing date (<i>day/month/year</i>) 02 July 2004 (02.07.2004) | Priority date (<i>day/month/year</i>) 07 July 2003 (07.07.2003) |
| International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237 | | |
| Applicant KONINKLIJKE PHILIPS ELECTRONICS N.V. | | |

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|--|---|---|---------------------|--|----------|--------------------------------------|--|-------------------------------------|----------------------------|---|---|-------------------------------------|-------------------------|---|--|--|---|
| 1. | This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a). | | | | | | | | | | | | | | | | |
| 2. | <p>This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p> | | | | | | | | | | | | | | | | |
| 3. | <p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"><input checked="" type="checkbox"/> Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/> Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/> Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/> Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> | <input checked="" type="checkbox"/> Box No. I | Basis of the report | <input checked="" type="checkbox"/> Box No. II | Priority | <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> Box No. VI | Certain documents cited | <input checked="" type="checkbox"/> Box No. VII | Certain defects in the international application | <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application |
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| <input type="checkbox"/> Box No. IV | Lack of unity of invention | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Box No. VI | Certain documents cited | | | | | | | | | | | | | | | | |
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| <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application | | | | | | | | | | | | | | | | |
| 4. | The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2). | | | | | | | | | | | | | | | | |

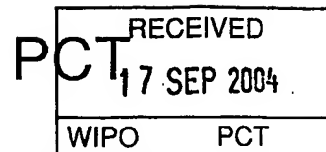
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| <p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 740 14 35</p> | <p>Date of issuance of this report 09 January 2006 (09.01.2006)</p> <hr/> <p>Authorized officer</p> <p style="text-align: center; font-weight: bold;">Idhir Britel</p> <p>Telephone No. +41 22 338 70 60</p> |
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220



WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2004/051102

International filing date (day/month/year)
02.07.2004

Priority date (day/month/year)
07.07.2003

International Patent Classification (IPC) or both national classification and IPC
G01R33/389

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/051102

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/051102

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(I) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-18 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-18 |
| Industrial applicability (IA) | Yes: Claims | 1-18 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB04/51102

The present opinion is based on the following application documents:

Description, pages:

1-6 as originally filed

Claims, No.:

1-18 as originally filed

Drawings, sheets:

1-4 as originally filed.

ad V:

1.) Reference is made to the following documents:

D1 = US-A-5 652 514

D2 = US-B-6 404 196.

2.) Lack of an Inventive Step (Article 33(1), (3) PCT)

2.1 *Claims 1, 11, 15*

The subject-matter of the independent claims 1, 11, 15 would appear to lack an inventive step with respect to each of the documents D1 and D2 (see, e.g., the passages of these documents cited in the search report), for the following reasons.

Document D1 discloses a method of monitoring a magnetic field drift of an MRI apparatus (see D1, e.g., col. 3, lines 11-13), the method comprising the steps of performing a first data acquisition of a first MR signal, caused by a first excitation, and determining the phase of the first signal at an echo time (see D1, e.g., equations (6) and (7)), performing a second data acquisition of a second MR signal, caused by a second excitation, a time interval after the first data acquisition (see D1, e.g., col. 4, lines 26-30 and fig. 2) and determining the phase of the second signal at the echo time (see D1, e.g., equation (8)), determining a phase shift based on a difference of the first and second phases (see D1, e.g., equations (8), (11), (12)). According to present claim 1, a resonance frequency shift is determined instead of a phase shift like in D1. However, it is obvious to anyone skilled in the art that the effect of the field drift can be quantified either in terms of a phase shift, or in terms of a field change, or in terms of a resonance frequency shift, depending on the kind of correction for the field drift envisaged. Thus, the subject-matter of claim 1 appears to lack an inventive step with respect to D1. The same is true for the corresponding device claims 11 and 15.

Lack of an inventive step with respect to document D2 can be demonstrated in a similar manner.

2.2 *Claims 2-10, 12-14, 16-18*

These dependent claims do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, since the additional features of these claims would appear either (claims 3-7, 10, 12-14, 17, 18) to have been used for the same purpose already in the prior art cited in the search report, or (claim 2) to involve merely obvious applications of the technique disclosed in D1, or (claim 9) obvious alternatives thereto, or (claims 8 and 16) design possibilities which readily occur to those skilled in the art.

ad VII:

- 1.) The independent claims should be cast in the two-part form.
- 2.) Documents D1 and D2 should be acknowledged.

ad VIII:

- 1.) *Claim 1*
 - a) It is not clear the drift of which of the magnetic fields used for MRI is being considered.
 - b) The formulation "performing ... data acquisition by a ... magnetic resonance signal" (emphasis added) is somewhat strange.
 - c) It is not clear whereto the "excitation" is applied, nor wherefrom a magnetic resonance signal is obtained.
 - d) The formulation "an echo time after ..." seems to suggest that an echo is somehow generated. This should be stated more explicitly, and it should be indicated whether it is a gradient echo or a spin echo.
 - e) According to the description, it is an essential feature of the invention that no special monitor signals are required (see, e.g., page 1, line 28 - page 2, line 3), and, more particularly, that the central k-space line of an imaging sequence is used as the monitor signal (see, e.g., page 2, lines 4-6). This

feature, however, is absent from claim 1. Claim 1, therefore, would not appear to be supported by the description.

- f) The scope of claim 1 covers also the possibility that not only a single phase value but a whole series of phase values is acquired from each of the two signals, in the absence of a readout gradient, so that an actual value of the resonance frequency can be determined from each of the signals. However, the description would appear to support neither the possibility that the actual resonance frequency is determined for each of the signals, nor the possibility that the signals are acquired in the absence of a readout gradient. The scope of claim 1 therefore is broader than what is justified by the extent of the disclosure.
- g) It should be indicated **of what** "a resonance frequency" is the resonance frequency, and it should be specified that the cause of "a shift of a resonance frequency" is the magnetic field drift.
- h) Since the difference between the phases of signals acquired at different times yields only the time integral of the deviation of the resonance frequency from a stable reference frequency it is obscure how "a shift of a resonance frequency" can be obtained from the phase difference. Additional assumptions, or steps, appear to be involved which should be specified explicitly in the claim.

2.) *Claim 2*

- a) The expression "signal shot" should probably read "single shot".
- b) It is not clear whether "are performed" means "are each performed".

3.) *Claim 11*

The scope of claim 11 is obscure (e.g., is a program or a storage medium claimed ? what are "program means" as distinct from a program ? in which sense are the program means "adapted": how did they look like before they were "adapted" ? how can the program as such perform excitations and determine phases of resonance signals ? etc.).

4.) *Claims 13,17*

The scope of these claims, which allows **any** type of control of the excitation, is

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB04/51102

broader than what is justified by the extent of the disclosure which mentions only a control in the form of a change of the transmitter frequency.